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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,093	09/17/2003	Seok-Jun Won	5649-906DV	6185
20792	7590	08/18/2005	EXAMINER	
MYERS BIGEL SIBLEY & SAJOVEC			WEISS, HOWARD	
PO BOX 37428			ART UNIT	
RALEIGH, NC 27627			PAPER NUMBER	
			2814	
DATE MAILED: 08/18/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,093

Applicant(s)

WON ET AL.

Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,10 and 12-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-8, 10 and 12-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

Attorney's Docket Number: 5649-906DV

Filing Date: 9/17/03

Continuing Data: Division of 10/028,187 (12/20/2001 now U.S. Patent No. 6,653,186)

Claimed Foreign Priority Date: 12/26/00 (KRX)

Applicant(s): Won et al. (Yoo)

Examiner: Howard Weiss

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/16/05 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 2, 4 to 8, 10 and 12 to 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Amended Claims 1 and 8 state that the first capacitor dielectric layer, in addition to other properties, seal and protect the mold layer. However, the Specification describes (e.g. Figure 5 and Page 7 Lines 21 and 22) "...the first capacitor dielectric layer 112 may seal and protect the lower mold layer 106 ...". The Examiner notes that the first capacitor dielectric layer 112, as portrayed in the description, is actually the second capacitor dielectric as described in the amended Claims 1 and 8. The

first capacitor dielectric layer, as described in the claims, is layer **118**. Therefore, there seems to be a conflict as to which capacitor dielectric layer serves to seal and protect the mold layer.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 2, 4 to 8, 10 and 12 to 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (U.S. Patent No. 6,274,426), Yamada (U.S. Patent No. 5,023,683) and Nakamura (U.S. Patent No. 6,573,553).

Lee et al. show most aspects of the instant invention (e.g. Figure 9B) including:

- an electrically insulating, silicon oxide support layer **10b** having an opening and on an integrated circuit substrate **1**
- a U-shaped lower electrode **16** with an inner surface and a outer portion
- a first capacitor dielectric layer **17** extending on the inner surface, on the outer portion and on the support layer

- a second capacitor dielectric layer **14c** extending between the outer portion and an inner sidewall of the opening and said second capacitor dielectric layer not extending on said inner surface and made of an oxide etch-resistant material (i.e. silicon nitride)
- an upper electrode **18** on the first capacitor dielectric layer

Lee et al. do not show the second capacitor dielectric between the outer portion of the lower electrode and said first capacitor dielectric and directly contacting a surface of the first capacitor dielectric layer opposite the lower electrode, the support layer comprising an etch stop layer of silicon nitride and an mold layer of silicon oxide and said first dielectric layer comprising tantalum oxide and extending into the support layer.

Yamada teaches (e.g. Figures 1) to extend a second dielectric **9a** so as to be above the upper surface of a support layer **7a** to maintain the prescribed capacitance of the storage capacitor (Column 9 Lines 1 to 12). If the second capacitor dielectric of Lee et al. is extended as taught by Yamada then it would be between the outer portion of the lower electrode and said first capacitor dielectric and directly contacting a surface of the first capacitor dielectric layer opposite the lower electrode. It would have been obvious to a person of ordinary skill in the art at the time of invention to extend the second dielectric so as to be above the upper surface of a support layer and, therefore, be between the outer portion of the lower electrode and said first capacitor dielectric and directly contacting a surface of the first capacitor dielectric layer opposite the lower electrode as taught by Yamada in the device of Lee et al. to maintain the prescribed capacitance of the storage capacitor.

Nakamura teaches (e.g. Figure 31B and Column 27 Line 1 to Column 28 Line 67) to make a support layer with an etch stop layer **47** comprising silicon nitride, a mold layer **24** consisting of silicon oxide, and to extend the first capacitor dielectric **55**, comprising tantalum oxide, into the support layer to realize an higher integration and

higher density semiconductor integrated circuit device (Column 30 Lines 8 to 11). It would have been obvious to a person of ordinary skill in the art at the time of invention to make a support layer with an etch stop layer comprising silicon nitride, a mold layer consisting of silicon oxide, and to extend the first capacitor dielectric, comprising tantalum oxide, into the support layer as taught by Nakamura in the device of Lee et al. to realize an higher integration and higher density semiconductor integrated circuit device.

Response to Arguments

6. Applicant's arguments filed 6/16/05 have been fully considered but they are not persuasive. In reference to the composition of the electrically insulating support layer, Nakamura et al. teach this limitation (see rejection above). In reference to the claim language referring to the sealing and protective properties of the first capacitor dielectric layer on the mold layer, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto* , 136 USPQ 458, 459 (CCPA 1963).

Conclusion

7. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the

Art Unit: 2814

hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via Howard.Weiss@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (571) 272-1705.

9. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 304, 309	thru 8/11/05
Other Documentation: none	
Electronic Database(s): EAST, IEL	thru 8/11/05

HW/hw
12 August 2005



Howard Weiss
Primary Examiner
Art Unit 2814